



## Ecosystem Management Program BULLETIN



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### MĀKUA GOATS MAY BE A THING OF THE PAST.

Since 1994 the Army has been doing extensive goat control in Mākua Valley to eliminate goats and thus protect the many native ecosystems and rare species in the Valley. Feral goats have been destroying native forests in Mākua for over 100 years. 100 years represents a mere moment in the life of Mākua Valley and the Wai'anāe Mountains which were formed some four million years ago. In this short time, goats have destroyed native forests through browsing, erosion and spread of alien plant seeds.



Goats on 'Ōhikilolo Ridge prior to fencing

Goat removal from Mākua began in 1994 by the U.S. Department of Agriculture, Wildlife Services (at the time Animal Damage Control). The first section of the 'Ōhikilolo ridgeline fence was completed in 1996.

The last section of this ridgeline fence was completed in February of 2000. This fence was critical in the ultimate control of goats in the Valley. The 'Ōhikilolo fence

effectively separated the Mākua goats from neighboring populations in Mākaha and Kea'au.

To date, over 1,000 goats have been removed from Mākua Valley. Ground hunting was responsible for removing the majority of these. Other control techniques that were employed included, aerial hunting with helicopters, goat herding and the "Judas Goat" technique. The "Judas Goat" technique was employed by the National Park Service on Hawai'i Island and on Maui in their goat removal efforts. A few goats are radio-collared and tracked to locate goat herds. This was especially important when goat numbers in Mākua became very low.



Fence line following 'Ōhikilolo Ridge, note vegetation on Mākua side

The natural resource staff monitor goat sign via ungulate transects and scoping. Since 2003, there has been no goat sign or sightings recorded. The natural resource staff have conducted goat surveys and scoping trips that cover a huge part of the Valley to determine if there were any remaining goats. The staff could find no sign and believe the Valley is free of feral goats. Currently, staff are monitoring Mākua

Valley fence lines quarterly in order to conduct maintenance and repair. There is always a possibility that goats from neighboring areas may find their way through fences and into Mākua. The staff will respond quickly to any sign of a goat breaching the 'Ōhikilolo fence boundary and will in this way be able to keep goats out of Mākua. The native forests in Mākua have recovered rapidly.

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‘Ōhikilolo ridge, where ‘ie‘ie (*Freycinetia arborea*) was browsed to two meters above ground by goats, is flourishing and so thick with ‘ie‘ie vegetation now that it is difficult to move around when weeding. The Kahūli tree snails (*Achatinella mustelina*) can be seen in abundance on the ‘ie‘ie there.

**POHAKULOA TRAINING AREA STAFF CONDUCT CAVE RESCUE TRAINING.** The Pōhakuloa Training Area cultural resources section sponsored the first ever cave rescue training event on

March 28 and 29, 2006. Participants in the training included the entire Pōhakuloa cultural resources staff and members of the Pōhakuloa fire department. Cave rescue involves many unique challenges not found in other forms of search and rescue. These include lighting challenges, unknown passages, temperature, tight crawls, loose rock, limited radio communication, in addition to trying to protect fragile geology, biological, archaeological and paleontological resources. Getting an injured individual out of a cave may involve many players and require a high degree of logistic coordination.



Cave rescuers in action during Cave Rescue Training

As first responders to an emergency rescue situation at Pōhakuloa Training Area, it was recognized that the fire department staff could greatly benefit from cave rescue training and seeing first hand what some of the challenges might be. Fortunately over the last several years, the cultural resource program has been working closely with members of the Hawaii caving community, mapping and surveying the extensive lava tube systems found at Pōhakuloa.

This year veteran cavers Don Coons and Jansen Cardy offered to take the lead in putting together training sessions on cave rescue. Coons and Cardy have extensive experience with cave rescue. Cardy performs training for



Working together as a team during Cave Rescue Training

the National Cave Rescue Commission and Don Coons was a key rescuer in a high profile 4-day rescue operation at Lechiguilla Cave located at Carlsbad Caverns National Park, New Mexico, several years back. Combined experience for Coons and Cardy totals nearly 50 years of active caving.

The cave rescue training involved two full days of training, with most of the emphasis upon hands-on activities. The first half-day was spent in the classroom with participants becoming familiar with “packaging” a patient, utilizing a SKED and full back and neck bracing. The training also involved having staff in real life field rescue scenarios to give them a feel for how a real-time event would take place.

The rescue training revealed numerous issues for all of us. First, communication and designation of responsibility through the establishment of an Incident Command was essential. Non-firefighters in the group not familiar with the management of a search and rescue mission learned a great deal regarding the logistics involved in a full on rescue. The firefighters learned a lot about what challenges they might face in performing a cave rescue, from radio communication limitations (runners were used to relay messages through to IC), to the actual packaging and removal of an individual. Additionally it was clear that cave entrance control, logging everybody that goes in and out, is essential.

#### **PŌHAKULOA TRAINING AREA PROPAGATION FACILITY AND OUTPLANTING HELP SAVE RARE PLANT SPECIES.**

The US Army Garrison Natural Resource Program provide effective stewardship of natural resources on the 109,000-acre Pōhakuloa Training Area. One of the highlights of efforts over the past several years has been the successful propagation of



most of the federally listed plant species found at Pōhakuloa Training Area in the 1,920 square-foot propagation facility. Several common native species are also being propagated in this facility.



Kathy Kawakami, Pōhakuloa Horticulturist in the Greenhouse

In 1997 the Environmental Office at Pōhakuloa Training Area built a propagation facility primarily for the propagation of the rare plants species native to the area. Propagating endangered plants at Pōhakuloa Training Area allows for outplanting and establishing a genetic "safety-net" for endangered species.

Pioneering propagation techniques for rare dryland species at Pōhakuloa Training Area is one of the first steps toward protecting these plants. Management of the propagation facility consists of germinating seeds, transplanting seedlings, treating plants for insect pests and disease, fertilizing, and weed control.

The primary purpose of propagation and outplanting at Pōhakuloa Training Area is to avoid the possibility of extinctions due to unforeseen catastrophic events (e.g., wildfire, volcanic eruption, etc.). Even with the most dutiful on-site management efforts, the probability of a single plant population (even a large population), eventually becoming extirpated is high. The best strategy to ensure the survival of small populations subjected to multiple threats is to propagate numerous individuals in a greenhouse setting and outplant them in geographically isolated populations. Although it is difficult to predict the interactions among many factors that may affect rare plants, populations are currently being managed through this program to reduce effects of catastrophic events.

**ELEPAIO NEST LOCATED ON PŌHAKULOA FOR FIRST TIME!** The Hawai'i Elepaio (*Chasiempis sandwichensis sandwichensis*) is a subspecies endemic to the island of Hawai'i. You may have noticed an article in

our February bulletin on the O'ahu Elepaio (*Chasiempis sandwichensis ibidis*), a subspecies endemic to the island of O'ahu. The Hawai'i Elepaio is a resident in dry leeward forests in south and west Hawai'i. Threats to the Elepaio include feral ungulates, introduced predators (rats, cats, mongoose), avian malaria and pox, and fire.

A small, and decreasing population of Hawai'i Elepaio has been documented in bird surveys on the Big Island's Pōhakuloa Training Area for over a decade. Although young fledglings have been seen once in recent years, no Elepaio nests have ever been located on Pōhakuloa. This recently changed during a survey to document the presence of one of the two remaining nesting pairs of Pōhakuloa Elepaio. The



Elepaio habitat at Pōhakuloa

April 2006 survey was conducted by Lena Schnell and Jefferson Jacobs, both of the Pōhakuloa Natural Resource Office. The two biologists had encountered as many as four Elepaio at the start of the survey, and had split up to follow the individual birds. After following a pair of Elepaio for more than 20 minutes, Jefferson lost sight of them as they made a long flight (indicative of travel to a nest) towards Lena who was then able to follow them to their nearby nest.

The extremely camouflaged pendulous nest is located approximately seven meters high in a Mamane (*Sophora chrysophylla*) tree, surrounded by mamane/naio habitat.



When originally found, the nest was still under construction. But more recently, the female has been observed incubating. The nest will be monitored closely and a surrounding rodent control grid will be maintained throughout the breeding season to decrease the threat of rats on the nest!



Hawaii Elepaio at Pu'u Lā'au, photo courtesy of Dr. Eric Vanderwerf

**Army Natural Resource Program Celebrates Earth Day 2006.** This year's Earth Day met with much enthusiasm from the Army's Natural Resource Staff. To celebrate the event and to help reach out to members of the community; the staff participated in a variety of activities. On Thursday April 20<sup>th</sup> the Natural Resource Manager presented a talk to students from the Bennett Youth Center at Schofield Barracks. The talk centered on introducing the students to the concepts of native versus non-native species and the various threats that face our endangered species. They were also given a glimpse into the life of a natural resource staff member.



Darryl York, PTA Biologist leads a hiking tour

Also on Thursday April 20<sup>th</sup>, the Pōhakuloa Training Area (PTA) Natural Resource staff led a morning and an afternoon hiking tour to the Army's emergency fence enclosures. These enclosures are placed around the endangered plants most threatened by browsing animals at PTA, *Silene lanceolata* and *Hedyotis coriacea* (Kio'ele). The groups were very enthusiastic about Hawaiian plants and asked engaging questions.

Saturday April 22<sup>nd</sup>'s O'ahu event was a grand success and was truly a "Weed Romp". Thirteen hearty volunteers tromped about at the Summit of Mt. Ka'ala in the Wai'anae Mountains. The weather was misty and cool, perfect weather for hard work. The task of the day was weed removal from a near pristine native rainforest.



Volunteer group enjoying the scene from the end of the boardwalk

Saturday's volunteers steadily pulled out a non-native and invasive sedge called *Juncus effusus*. After yanking the alien plants from the ground, volunteers removed clumps of mud from the root-ball taking care not to leave any roots behind as they may resprout. The group then packed up *Juncus* plants into garbage bags and hauled them uphill to a truck where plants were unloaded.

For lunch, The groups hiked to an overlook at the end of the boardwalk trail for a picnic. The site offered views of Wai'anae and Mākaha Valleys and the entire Leeward Coast. After lunch, volunteers hiked back to the trucks, along the way learning native plants and animals. The group was lucky to see *Tremataloblia macrostachys* (Koli'i) and *Liparis hawaiiensis* (Awapuhi a Kanaloa), a native orchid in flower.

Mahalo to everyone who participated in our Earth Day events and for the hard work of our volunteers. We hope to see you all again soon!





*Liparis hawaiiensis* (Awapuhi a Kanaloa)

#### INTRODUCING A NEW MEMBER OF THE O'AHU

**STAFF:** Kristen began work as a Natural Resource Management Technician with the Army's Oahu Program in April 2006. Kristen received a B.A. in Environmental Studies, with a focus on Hawaiian resource management and conservation, from the University of Hawaii in December 2005. Kristen was raised in Hawaii and has worked in the field of conservation in Hawaii since high school. Kristen was a member of the Youth for Environmental Services, she interned with the Koke'e Resource Conservation Program, Haleakala National Park Feral Animal Management Team and she interned with our program in the fall of 2005. Kristen has a very broad base of experience in conservation, having conducted weed control, tree snail work, rare plant work, and avian conservation work. We are happy that Kristen can "hit the ground-running" on many of our projects as she is already familiar with Oahu's Natural areas and our projects. Kristen's commitment to conservation and great sense of humor make her a pleasure to work with. Welcome aboard Kristen!



Kristen Nalani Mailheau

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